

## Analysis of factors affecting adolescent patients' demands for orthodontic treatment

Why do you want orthodontic treatment?

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### Abstract

**Aim:** This study aimed to evaluate the factors that affect adolescent patients' treatment requests and determine their main reasons for demanding orthodontic treatment.

**Material and Methods:** This cross-sectional retrospective study included 360 (189 female and 171 male) adolescents (mean age: 15.49±2.28 years) who demanded orthodontic treatment. Face-to-face interviews were conducted by an orthodontist using a specially structured questionnaire to determine the reasons for these demands. Pearson's chi-square test and Fisher's exact test were used to analyze the relationships between dental malocclusion groups and reasons for demanding treatment. Statistical significance was set at  $p < 0.05$ .

**Results:** The demands for orthodontic treatment did not differ between male and female patients but were significantly affected by malocclusion type. Patients concerned with dental crowding (DC) demanded orthodontic treatment the most (50.6%), regardless of DC severity, followed by patients (30.6%) concerned with dental esthetics (30.6%). Overall, 57.8% of patients who demanded orthodontic treatment reported a problem in the maxillary anterior teeth. Regarding the relationship between demanding orthodontic treatment and patients' problematic areas, no relationship was observed for class I and II malocclusions but a relationship was observed for class III malocclusions.

**Discussion:** It is necessary to identify adolescent patients' reasons for demanding orthodontic treatment and establish what would represent a successful treatment outcome. Regardless of DC severity, irregularity in the upper anterior region was the most common reason for patients to demand treatment.

### Keywords

Demand for Treatment, Dental Malocclusion, Dental Crowding, Orthodontic Treatment

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**Introduction**

Dental malocclusion can be considered a public health problem due to its high prevalence (39-93%) in the population and the need for prevention and treatment possibilities [1]. Several studies have reported the effects of malocclusion on the quality of life [2], and malocclusion has been recognized by the World Health Organization as the third-highest priority for oral health [3].

The main goal of orthodontics is to improve dental occlusion and eliminate malocclusion, one of the etiological factors of periodontal disease, dental caries, and temporomandibular joint disorders. In addition, the esthetic improvement that is obtained as a result of orthodontic treatment helps develop the individual's sense of self and is highly gratifying [4]. Patients' and parents' expectations regarding orthodontic treatment include the improvement of dentofacial esthetics, oral health, and self-esteem [5].

Many previously published studies have reported various reasons for and factors affecting patients' demands for orthodontic treatment [4-6]. These factors include self-esteem, facial esthetics, self-image, dentofacial appearance, status, pride, discomfort, concerns for future oral health, parents' and friends' influences, referrals by dentists, gender, age, and severity of malocclusion and dental crowding. The effects of these factors depend on the sociocultural characteristics of each subgroup of the population [7, 8].

Identifying the factors involved in the requests for orthodontic treatment in a population enables better planning of resources and better assessment of treatment needs and priorities [9]. Understanding this situation is extremely important for public health.

It remains unclear which concerns are most common in adolescent patients demanding orthodontic treatment. In other words, it is not well documented which dental or visual traits predominantly motivate or affect patients demanding orthodontic treatment. Thus, this study aimed to determine the reasons and motivating factors that affect patients' demands for orthodontic treatment at orthodontic clinics.

**Material and Methods**

This cross-sectional retrospective study was conducted using a specially structured questionnaire and dental cast models of 360 patients who presented to the Department of Orthodontics of the Faculty of Dentistry of Erciyes University between 2017 and 2019. This study was approved by the Erciyes University Clinical Research Ethics Committee (Approval Code: 2020/333). The determination of patients to be included in the study was performed by random selection (coin-toss method) according to the inclusion criteria during the first examination performed immediately after patients underwent consultation regarding their orthodontic treatment demands. The authors obtained informed consent from all patients and their parents before beginning treatment and before administering the questionnaire. These 360 patients (mean age: 15.49±2.28 years) were divided into 3 groups as dental class I (CI-I; mean age: 15.25±2.23 years), dental class II (CI-II; mean age: 15.27±2.09 years), and dental class III (CI-III; mean age: 15.97±2.48 years) according to Angle's dental malocclusion classification, with an

equal number of individuals in each group [10].

Aside from administering the questionnaire, a complete clinical examination was performed for all included patients by the same orthodontist (G.C.) using a mouth mirror under natural lighting. For each patient, following the clinical examination, the orthodontist took an alginate impression for a dental cast. The inclusion criteria for participation were defined as follows: patients undergoing orthodontic examination for the first time; patients aged 13-18 years; patients who had not received orthodontic treatment before; patients whose orthodontic treatment started in our orthodontic department; and patients for whom the main demands for requesting treatment and the amount of dental crowding in millimeters for the upper and lower jaw were clearly recorded on questionnaire forms. Exclusion criteria were as follows: patients with a syndromic disease, congenital anomaly, or craniofacial deformity; those with prosthetic restoration; and those with a history of severe trauma.

**Questionnaire**

The modified questionnaire included the following components [11, 12]:

1. Demographic data (sex and age) obtained directly from the patients and their parents.
2. Self-satisfaction with their teeth, which patients subjectively assessed.
3. Awareness of their teeth and mandibular position, which patients subjectively assessed.
4. Motivation for demanding orthodontic treatment (e.g., to improve esthetics, dental appearance), which was determined through questions asked by one of the investigators.

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**Questionnaire to evaluate the opinions of patients who think that they need orthodontic treatment and where the problem is and why they seek treatment.**

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**Part 1. Demographic data of the patient:**

Age ..... year

Sex  Male  Female

**Part 2. Questions**

Q1. Why do you seek orthodontic treatment?

A: Secondary Motivation

B: My teeth are crowded

C: Aesthetic reasons

D: Mandibular prognathism

E: Mandibular retrognathism

Please mark the only one item you see suitable for you.

Q2. Which teeth do you think your disorder is in?

A: Upper anterior teeth

B: Upper overall teeth

C: Lower anterior teeth

D: Lower overall teeth

E: Upper and lower anterior teeth

F: Upper and lower overall teeth

Please mark the only one item you see suitable for you.

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**Figure 1.** Questionnaire form used to evaluate patients' reasons for demanding orthodontic treatment and noticed problem areas

The responses of the patients about their demands for orthodontic treatment were evaluated. For this purpose, patients were asked two questions: to select one of five items regarding the reason for demanding treatment and one of six items regarding which teeth they wanted to have treated (Figure 1) [11]. The same orthodontist who administered the survey during the first examination collected the questionnaire answers while parents were not present. No orthodontic data were obtained from the patients' parents because it was the opinion/self-assessment of the adolescent patients demanding orthodontic treatment that was evaluated.

**Dental Model Analysis**

The amount of crowding was determined using dental casts to evaluate the effects of dental crowding in the maxilla and mandible on the patients' orthodontic treatment demands. During the initial orthodontic examination before treatment, dental models of the maxilla and mandible were obtained with alginate impression material (Tropicalgin, Zhermack, Badia Polesine, Italy). These casts were scanned with a 3Shape dental model scanner (3Shape R700 3D Scanner, 3 Shape A/S, Copenhagen, Denmark) and transferred to digital media. Hayes-Nance analysis was performed using OrthoAnalyzer software (3Shape A/S, Copenhagen, Denmark) on the scanned models, and the amounts of dental crowding in the upper and lower jaws of the patients were classified as mild, moderate, and severe where mild crowding was defined as arch length-tooth length discrepancy of up to 3 mm, moderate crowding as discrepancy of 3-6 mm, and severe crowding as discrepancy over 6 mm [10]. These dental crowding values were divided into subgroups for the lower and upper jaws.

**Statistical Analysis**

As a result of power analysis, it was determined that 120 patients in each group would be sufficient with 5% error, 95% power, and 0.59 effect size. Questionnaire answers obtained from the patients were recorded as categorical data and processed with Microsoft Office Excel (Office 365, Microsoft Corporation, Redmond, WA, USA). Pearson's chi-square test and Fisher's exact test were used to evaluate the relationship between dental crowding groups, the area where the patient noticed a problem, dental malocclusion groups, and the reasons for orthodontic treatment demands. The data obtained are presented as sample counts and percentage values. In addition, while one-way ANOVA was used to evaluate relationships with age between dental malocclusion classes, the independent samples t-test was used to assess relationships with age

between male and female patients. Statistical evaluations were conducted using Stata/ICC Statistical Software (Version 15.1, StataCorp LLC, College Station, TX, USA). Statistical significance was set at  $p < 0.05$ .

**Reproducibility**

Fifty patients' dental models were reexamined 1 month after their first measurements by the same investigator (T.O.). Intraclass correlation coefficients for dental crowding measurements were 0.81 and 0.89 for the maxilla and mandible, respectively, indicating sufficient reliability.

**Results**

According to Angle's dental malocclusion classification, there was no significant difference between male and female respondents in the evaluations (Table 1).

According to the data obtained, there was a statistically significant relationship between the reasons for patients to demand orthodontic treatment and dental malocclusion type ( $p < 0.05$ , Table 1). The main concerns of the patients were crowding of the teeth and esthetic reasons for all types of dental malocclusions. Patients with CI-II malocclusion complained that "my lower jaw is behind compared with my upper jaw," whereas patients with CI-III malocclusion complained that "my lower jaw is ahead compared to my upper jaw." There were no significant differences in reasons for demanding orthodontic treatment between genders.

The total distribution of dental crowding groups according to the reasons for demanding treatment is presented in Tables 2 and 3. It was determined that the vast majority of patients had mild crowding in the upper and lower dental arch ( $n = 162$ , 45.0%), and the area that patients noticed to be problematic was mostly the maxillary anterior region ( $n = 208$ , 57.8%). The general reasons for these patients to demand orthodontic treatment were dental crowding and esthetics.

In patients with dental CI-I malocclusion, a significant relationship could not be established between dental crowding (Table 2), the noticed problem area (Table 3), and the reasons for demanding orthodontic treatment ( $p > 0.05$ ). No complaints of mandibular retrognathism and/or prognathism were observed in dental CI-I malocclusion patients. It was found that the vast majority of patients had mild crowding and the noticed problem area was the maxillary anterior teeth ( $n = 50$ , 41.7%).

In patients with dental CI-II malocclusion, no significant relationship was found between dental crowding (Table 2), the noticed problem area (Table 3), and the reasons for demanding

**Table 1.** Cross-tabulation showing the relationships between reasons for demanding orthodontic treatment, dental malocclusion classes, and gender

	Secondary motivation	"My teeth are crowded"	Esthetic reasons	Mandibular prognathism	Mandibular retrognathism	Total	p
<b>Dental malocclusion type</b>							
Dental class I	10 (8.3)	65 (54.2)	45 (37.5)	0 (0.0)	0 (0.0)	120	
Dental class II	10 (8.3)	67 (55.8)	35 (29.2)	0 (0.0)	8 (6.7)	120	<0.001 FE
Dental class III	10 (8.3)	50 (41.7)	30 (25.0)	30 (25.0)	0 (0.0)	120	
<b>Gender</b>							
Female	14 (7.4)	99 (52.4)	57 (30.2)	16 (8.5)	3 (1.6)	189	
Male	16 (9.4)	83 (48.5)	53 (31.0)	14 (8.2)	5 (2.9)	171	0.840 PC
Total	30 (8.3)	182 (50.5)	110 (30.6)	30 (8.3)	8 (2.3)	360	

Values are presented as number of subjects and percentage; % indicates row percentage. Pearson's chi-square (PC) test and Fisher's exact (FE) test were performed. Statistically significant difference:  $p < 0.05$ .

**Table 2.** Distribution of individuals according to dental crowding according to the reasons for demanding orthodontic treatment

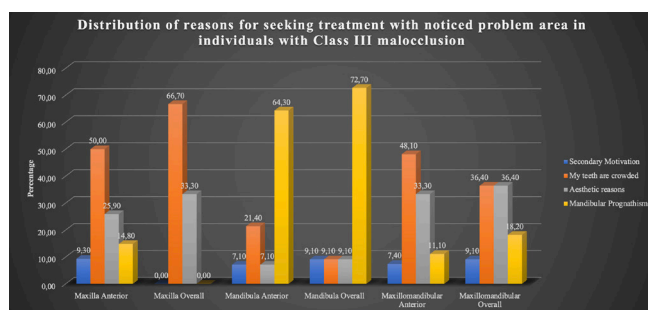
	Secondary motivation	"My teeth are crowded"	Esthetic reasons	Mandibular prognathism	Mandibular retrognathism	Total	p
<b>Dental class I</b>							
MxMi-MdMi	7 (14.0)	27 (54.0)	16 (32.0)	0 (0.0)	0 (0.0)	50	0.410
MxMo-MdMo	1 (4.8)	8 (38.1)	12 (57.1)	0 (0.0)	0 (0.0)	21	
MxSe-MdSe	1 (5.6)	10 (55.6)	7 (38.9)	0 (0.0)	0 (0.0)	18	
MxSe-MdNSe	1 (5.9)	11 (64.7)	5 (29.4)	0 (0.0)	0 (0.0)	17	
MxNSe-MdSe	0 (0.0)	9 (64.3)	5 (35.7)	0 (0.0)	0 (0.0)	14	
<b>Dental class II</b>							
MxMi-MdMi	5 (8.8)	29 (50.9)	17 (29.8)	0 (0.0)	6 (10.5)	57	0.600
MxMo-MdMo	4 (15.4)	17 (65.4)	3 (11.5)	0 (0.0)	2 (7.7)	26	
MxSe-MdSe	0 (0.0)	6 (60.0)	4 (40.0)	0 (0.0)	0 (0.0)	10	
MxSe-MdNSe	1 (4.2)	13 (54.2)	10 (41.7)	0 (0.0)	0 (0.0)	24	
MxNSe-MdSe	0 (0.0)	2 (66.7)	1 (33.3)	0 (0.0)	0 (0.0)	3	
<b>Dental class III</b>							
MxMi-MdMi	7 (12.7)	21 (38.2)	13 (23.6)	14 (25.5)	0 (0.0)	55	0.380
MxMo-MdMo	2 (11.1)	9 (50.0)	6 (33.3)	1 (5.6)	0 (0.0)	18	
MxSe-MdSe	0 (0.0)	8 (57.1)	3 (21.4)	3 (21.4)	0 (0.0)	14	
MxSe-MdNSe	1 (4.0)	7 (28.0)	7 (28.0)	10 (40.0)	0 (0.0)	25	
MxNSe-MdSe	0 (0.0)	5 (62.5)	1 (12.5)	2 (25.0)	0 (0.0)	8	
<b>Total</b>							
MxMi-MdMi	19 (11.7)	77 (47.5)	46 (28.4)	14 (8.6)	6 (3.7)	162	0.860
MxMo-MdMo	7 (10.8)	34 (52.3)	21 (32.4)	1 (1.5)	2 (3.0)	65	
MxSe-MdSe	1 (2.4)	24 (57.1)	14 (33.3)	3 (7.1)	0 (0.0)	42	
MxSe-MdNSe	3 (4.5)	31 (47.0)	22 (33.3)	10 (15.2)	0 (0.0)	66	
MxNSe-MdSe	0 (0.0)	16 (64.0)	7 (28.0)	2 (8.0)	0 (0.0)	25	
Totally	30 (8.3)	182 (50.5)	110 (30.6)	30 (8.3)	8 (2.3)	360	

Data are given as number of samples and their percentage [n (%)] throughout rows for each cell. Mx: Maxilla, Md: mandibula, Mi: mild, Mo: moderate, Se: severe NSe: non-severe (mild or moderate), Ant: anterior, Ov: overall.

**Table 3.** Distribution of individuals according to noticed problem areas and reasons for demanding orthodontic treatment.

	Secondary motivation	"My teeth are crowded"	Esthetic reasons	Mandibular prognathism	Mandibular retrognathism	Total	p
<b>Dental class I</b>							
MxAnt	7 (9.6)	38 (52.1)	28 (38.4)	0 (0.0)	0 (0.0)	73	0.810
MxOv	1 (25.0)	2 (50.0)	1 (25.0)	0 (0.0)	0 (0.0)	4	
MdAnt	0 (0.0)	5 (83.3)	1 (16.7)	0 (0.0)	0 (0.0)	6	
MdOv	1 (4.3)	13 (56.5)	9 (39.1)	0 (0.0)	0 (0.0)	23	
MxMdAnt	1 (7.1)	7 (50.0)	6 (42.9)	0 (0.0)	0 (0.0)	14	
MxMdOv	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0	
<b>Dental class II</b>							
MxAnt	8 (9.9)	49 (60.5)	21 (25.9)	0 (0.0)	3 (3.7)	81	0.130
MxOv	0 (0.0)	1 (50.0)	1 (50.0)	0 (0.0)	0 (0.0)	2	
MdAnt	0 (0.0)	1 (25.0)	2 (50.0)	0 (0.0)	1 (25.0)	4	
MdOv	0 (0.0)	1 (33.3)	0 (0.0)	0 (0.0)	2 (66.7)	3	
MxMdAnt	1 (5.6)	9 (50.0)	7 (38.9)	0 (0.0)	1 (5.6)	18	
MxMdOv	1 (8.3)	6 (50.0)	4 (33.3)	0 (0.0)	1 (8.3)	12	
<b>Dental class III</b>							
MxAnt	5 (9.3)	27 (50.0)	14 (25.9)	8 (14.8)	0 (0.0)	54	0.005*
MxOv	0 (0.0)	2 (66.7)	1 (33.3)	0 (0.0)	0 (0.0)	3	
MdAnt	1 (7.1) a	3 (21.4) a	1 (7.1) a	9 (64.3) b	0 (0.0)	14	
MdOv	1 (9.1) a	1 (9.1) a	1 (9.1) a	8 (72.7) b	0 (0.0)	11	
MxMdAnt	2 (7.4)	13 (48.1)	9 (33.3)	3 (11.1)	0 (0.0)	27	
MxMdOv	1 (9.1)	4 (36.4)	4 (36.4)	2 (18.2)	0 (0.0)	11	
<b>Total</b>							
MxAnt	20 (9.6)	114 (54.8)	63 (30.3)	8 (3.8)	3 (1.4)	208	0.534
MxOv	1 (11.1)	5 (55.6)	3 (33.3)	0 (0.0)	0 (0.0)	9	
MdAnt	1 (4.2)	9 (37.5)	4 (6.7)	9 (47.5)	1 (4.2)	24	
MdOv	1 (7.1)	2 (14.3)	1 (7.1)	8 (57.1)	2 (14.3)	14	
MxMdAnt	4 (5.9)	35 (51.5)	25 (36.8)	3 (4.4)	1 (1.5)	68	
MxMdOv	3 (8.1)	17 (45.9)	14 (37.8)	2 (5.4)	1 (2.7)	37	
Totally	30 (8.3)	182 (50.5)	110 (30.6)	30 (8.3)	8 (2.3)	360	

Data are given as number of samples and percentage [n (%)] throughout rows for each cell. Mx: Maxilla, Md: mandibula, Ant: anterior, Ov: overall. \*Fisher's exact test was performed. Statistically significant difference: p<0.05. Different superscript letters in a row show differences between groups.



**Figure 2.** Distribution of patients’ reasons for demanding orthodontic treatment and noticed problem areas among patients with dental class III malocclusion

orthodontic treatment ( $p > 0.05$ ). Unlike other malocclusion classes, it was found that “my lower jaw is behind compared with my upper jaw” was the reason for demanding orthodontic treatment in only 6.6% (8 patients) in this group. While 47.5% of CI-II patients (57 patients) had mild crowding, 67.5% of CI-II patients (81 patients) thought that the problem area was the maxillary anterior teeth.

In patients with dental CI-III malocclusion, no significant relationship was found between dental crowding and the reason for demanding orthodontic treatment ( $p > 0.05$ , Table 2). Only “my lower jaw is ahead compared with my upper jaw” was observed among the reasons for demanding orthodontic treatment in this group. There was a significant relationship between the reason for demanding orthodontic treatment and the noticed problem area ( $p < 0.05$ , Table 3). Unlike the other malocclusion groups, there was a significant relationship ( $p < 0.05$ ) between mandibular prognathism and the fact that there were more people who thought that there was a problem in the mandibular anterior (64.3%) and the overall (72.7%) region in patients (Figure 2) included in this dental malocclusion class.

### Discussion

It is necessary to identify adolescent patients’ reasons for demanding orthodontic treatment and establish what would represent a successful treatment outcome. These concerns need to be recorded and focused on throughout treatment to avoid patient disappointment. A common cause of medicolegal problems after treatment is failure to resolve patients’ complaints [13]. However, we could not find any study in the literature that focused on reasons for demanding orthodontic treatment among Turkish adolescents. Therefore, this study was conducted to identify the most relevant demands for orthodontic treatment and their possible relationships with treatment decisions.

One of the most significant factors in adolescents’ demands for orthodontic care is whether they have malocclusion [14]. Lindegård et al. reported that in planning orthodontic care, it is necessary to consider not only the status of the teeth; the care needs expressed by specialists and the demands for treatment as expressed by patients must also be taken into account [15]. Other consumer factors include wishes to improve in appearance, gender and age, peer group norms, and social levels [16]. Similarly, the decisions of orthodontic care providers are affected by the dentist’s and orthodontist’s perceptions of

the need for treatment, recognition of malocclusion features, availability of services, and costs of treatment [14, 19].

The demand for orthodontic treatment can be considered as a way to improve the dentofacial appearance and gain self-confidence [8, 11, 12]. The requirements for orthodontic treatment are increasing in most countries. The literature shows the demand for treatment by the number of patients who have made appointments and are seeking care [18]. Orthodontic precautions must be planned rationally for the society in question to evaluate the necessary resources for providing such services. This information reveals the prevalence of different types of malocclusions based on epidemiological studies, the factors affecting patient demands, and the need for orthodontic treatment [1].

There is a consensus among orthodontists that they are motivated to demand orthodontic treatment due to the malocclusion’s unfavorable physical, psychological, and social consequences [2, 18]. However, it has been reported that malocclusion affects the quality of life in less than 50% of adolescents who need orthodontic treatment [2].

The growth and development in female adolescents may be slightly ahead of that of males, with a higher percentage of girls being ready to start treatment while boys may need further development [19]. Data for children in different populations revealed that females are more interested in orthodontic correction than males because of esthetics [20]. In all five main categories of secondary motivation, dental crowding, esthetic reasons, mandibular prognathism, and retrognathism, the demand for treatment was observed similarly among boys and girls [21], in contrast to other reports [14]. Our findings may be due to the fact that males in Turkish society care about physical appearance as much as females. Oliveira determined that adult patients complained of bad esthetics most frequently before treatment [8]. In contrast to our study, they found that a small number of adult patients complained of mastication and gum problems, cavities, and speech problems. Their study had a small sample size and provided pre- and posttreatment evaluations, but it did not fully reflect the determination of the patients’ pretreatment concerns. In addition, considering that most of the population seeking orthodontic treatment comprises adolescents, their findings are difficult to generalize. The most common complaint of patients who applied to our clinic (50.6%) was that their teeth were crowded, regardless of the severity of crowding [22]. Shaw et al. reported a positive relationship between patients’ demands for orthodontic treatment and visible irregularity in their teeth [23]. In our study, it was determined that the primary demand for orthodontic treatment was dental crowding. Similarly, Wędrychowska-Szulc and Syryńska reported that the main reason for the orthodontic treatment demands of adolescent patients and their parents or guardians was dental crowding leading to poor esthetic appearance [24]. However, they did not state which region dental crowding occurred in more frequently or where the patients noticed problems.

It has also been reported that 48% of individuals with moderate or severe visible irregularities stated that they were very or quite satisfied with their dental appearance, while those with minor or no abnormalities stated that they were dissatisfied with their

appearance at a similar rate [15, 23]. It was further reported that these individuals were disturbed by the appearance of their teeth, which were thought to be seriously affected by dental crowding or tooth morphology, multiple diastemata, or congenitally missing teeth. However, some studies have reported that dentofacial esthetics is the most influential factor in demands for treatment [10, 22]. Dissimilarity among these findings may be due to material differences.

When the relationship between dental malocclusion type and the reason for demanding orthodontic treatment was evaluated, a statistically significant difference was observed; thus, we evaluated the dental malocclusion classes separately. Among patients of all dental malocclusion classes, no significant relationship was found between the severity of dental crowding and the reason for demanding orthodontic treatment; however, when the relationships between noticed problem areas and reasons for demanding treatment were evaluated, a significant difference was observed only for dental class III malocclusions. Hence, patients with class III problems were more likely to demand evaluations than those with other malocclusions [25]. To report overall rates, we present them all in Table 3. Accordingly, 57.7% of patients were concerned about problems in the maxillary anterior teeth and 45% had mild dental crowding in both jaws.

Regarding dentofacial appearance, cultural factors also have powerful effects. An abnormality such as dental crowding or malocclusion such as CI-II or CI-III type evaluated as esthetically unacceptable in one population may be acceptable or even a marker of attractiveness in another [1].

#### Limitations

Although this study has limitations such as limited sample selection and its single-center nature, along with the need to consider other factors affecting orthodontic treatment demands and more objective assessments of orthodontic treatment needs such as the Index of Orthodontic Treatment Need, it can be predicted that this work will serve as a guide for further studies. With both objective and subjective evaluations, it will be possible to reveal the orthodontic treatment needs of Turkish adolescents from a different perspective and provide better guidance to orthodontists in this respect. One of the limitations of our study is that our questions were limited in number, but we still aimed to obtain accurate information using this questionnaire to achieve the purposes of our study. In addition, as our questionnaire was written using short and clear phrasing to achieve the desired results, the individuals being tested were not confused.

#### Conclusion

The results of this study have revealed the demands of patients requesting orthodontic treatment. These results can be summarized as follows:

- The main factor affecting the demand for orthodontic treatment is dental crowding, regardless of its severity.
- Patients who demand orthodontic treatment are most often dissatisfied with their upper anterior teeth.
- Significant differences were observed between the reasons for demanding orthodontic treatment and dental malocclusion classes.

- No difference was observed in reasons for requesting treatment between genders.

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#### Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

#### Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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